and isoleucine; and polymeric compounds mainly comprised of hydrocarbon having hydrophobicity (e.g. styrene oligomer and acrylic oligomer). As the protic solvent, for example, water; a polar solvent containing a water-based buffer component or the like is listed. As the working electrode having hydrophobicity, for example, an electrode having a hydrophobic functional group on the surface is listed. The working electrode having hydrophobicity can be obtained by, for example, treating the surface of the working electrode body formed of a metal oxide in which a silanol group is introduced with compounds to which a methyl group or a phenyl group may be introduced, such as methyltrimetoxysilane and phenyltriethoxysilane.

[0223] The length of the modulator **292** can be suitably selected within a range that does not inhibit the formation reaction of a complex on the working electrode, for example, the ligation reaction of the binding substance to the trapped analyte. It is preferable that the length of the modulator **292** is usually 100 nm or less. The lower limit of the length of the modulator **292** varies depending on the type of the modulator **292**. Thus, it is desirable to suitably set the lower limit according to the type of the modulator **292**.

[0224] As the labeling substance **293**, the same substance as the labeling substance **93** described in the first embodiment can be used.

[0225] Examples of the bond form of the modulator **292** and the binding substance **291** include covalent and non-covalent bonds.

[0226] The method for binding the modulator **292** to the binding substance **291** by a covalent bond is not particularly limited.

[0227] In the binding substance **291**, a site to which the modulator **292** is covalently bound is not particularly limited. From the viewpoint that the operation of binding the binding substance **291** to the modulator **292** is simple, amino and sulfhydryl groups are preferred.

[0228] Examples of a reaction group capable of binding to an amino group include a succinimido group (NHS), an isothiocyano group (ITC), a chlorosulfonyl group, a chloroacyl group, an oxyethylene group, a chloroalkyl group, an aldehyde group, and a carboxyl group. Among them, NHS and ITC are preferred because when the modulator **292** as a target is covalently bound via an amino group, a reaction in an aqueous system is essential, and the conditions capable of using a reaction compound are limited such that the pH of the reaction solution is in a neutral to weak alkaline region and the reaction is progressed at a reaction temperature of ice-cooling to about 37° C. for a short time. Therefore, a modulator having NHS and/or ITC can be used as the modulator **292**.

[0229] Examples of the reaction group capable of binding to a sulfhydryl group include a maleimide group and a bromoacetamide group. The sulfhydryl group normally forms a disulfide (S—S) bond in a polypeptide. Thus, when the sulfhydryl group is used as a site for binding to the modulator **292**, the disulfide structure in the polypeptide is reduced to be used as a sulfhydryl group. In the reduction of the disulfide bond, dithiothreitol (DTT), β-mercaptoethanol (β-ME), and mercaptoethylamine (MEA) can be used. Therefore, the modulator **292** has a functional group having high reactivity with an amino group and a sulfhydryl group (e.g. a succinimido group and a maleimide group), the modulator **292** can be directly bound to amino and sulfhydryl groups of the binding substance **291** by mixing the binding substance **291** and the modulator **292**. As the modulator **292**, for example, succinimide ester-modified DNA is listed.

[0230] When the modulator **292** has an amino group, a sulfhydryl group, an aldehyde group, a carboxyl group or the like, the binding substance **291** can be easily bound to the modulator **292** by binding the binding substance **291** to the modulator **292**, for example, via a chemical cross-linker; forming a dithiol bond between the binding substance **291** and the modulator **292** when the binding substance **291** has a sulfhydryl group; and performing a general chemical reaction.

[0231] The cross-linker generally has a linear structure and is formed of a spacer having a succinimido group which reacts with amino and thiol groups as well as a maleimide group at the both ends. The use of the cross-linker allows the binding substance **291** to be bound to the modulator **292**.

[0232] For example, when the modulator **292** has a thiol group, a cross-linker having a succinimido group at one end and having a maleimide group at the other end can be used in binding the modulator **292** to an amino group of the binding substance **291**. In this case, the amino group in the binding substance **291** is first reacted with the succinimido group in the cross-linker to introduce the maleimide group of the cross-linker into the binding substance **291**. The binding can be performed by reacting the maleimide group with the thiol group in the modulator **292**. Here, the length of the spacer of the cross-linker is not particularly limited. Specific examples of the cross-linker to be used include the same cross-linkers described in the first embodiment. The cross-linker may be glutaraldehyde in which functional groups at both ends have reactivity with an amino group, a cross-linker which has two functional groups (an amine-reactive NHS ester group and a light-reactive diazirine group) at the end or the like.

[0233] When the binding substance **291** and the modulator **292** have thiol groups, the binding is possible by reacting the thiol group of the binding substance **291** with the thiol group of the modulator **292** to form a dithiol bond. When the modulator **292** has a carboxyl group and the binding substance **291** has an amino group, the carboxyl group can be bound to the amino group of the binding substance **291** by activating with NHS. When the modulator **292** has an aldehyde group and the binding substance **291** has an amino group, a stable bond can be formed by forming a Schiff base between the aldehyde group of the modulator **292** and the amino group of the binding substance **291** and reducing it.

[0234] The method for binding the modulator **292** to the binding substance **291** by a non-covalent bond is not particularly limited.

[0235] As the method for binding the modulator **292** to the binding substance **291** by a non-covalent bond, a method for directly binding the binding substance **292** to the modulator **291** by a non-covalent bond and a method for binding the modulator **292** to the binding substance **291** via a substance bound by a covalent bond by a non-covalent bond are contemplated.

[0236] Examples of the method for binding the modulator **292** to the binding substance **291** by a non-covalent bond include a method for using bonding of streptoavidin to biotin and the like. Examples of the method for binding the modulator **292** to the binding substance **291** via a substance bound by a covalent bond by a non-covalent bond include a method comprising covalent-bonding DNA having an amino group at the end to the binding substance **291** and non-covalently